

REMARKS

Reconsideration of the patentability of all of the claims of the referenced application is solicited in view of the above amendments and the following comments. The indication of the allowability of the subject matter of claims 31-33, 37, 38, 42, 43, and 45-49 is acknowledged.

The rejection of claims 1-30, 34-36, 39-41, 44, 50, 51, 53, 54, and 57-59 under 35 U.S.C. 103(a), as being unpatentable over the Shimizu reference (EP 1065642), is respectfully traversed.

The rejection of claims 52, 55, and 59 under 35 U.S.C. 103(a), as being unpatentable over Shimizu in view of the Okamoto reference ("The Principle of Virtual viewpoint image synthesis using a road surface model", the 71st ITS International Conference, 2000), is respectfully traversed.

The rejection of claim 56 under 35 U.S.C. 103(a), as being unpatentable over the disclosure of the Shimizu reference in view of the disclosure of the Williams reference (USP 5,109,213), is respectfully traversed.

Claims 1, 50, 53 and 57 have been amended to now recite:

the feature of "image pickup means is attached to a car placed on a road surface",

the feature of "viewpoint change image synthesizing means produces a

synthesized image, in which a surrounding object is viewed from a virtual viewpoint different from a viewpoint of the image pickup means along a direction substantially vertical to a road surface, from an image obtained by said image pickup means and draws the synthesized image on a plane corresponding to the road surface”, and

the feature of “car locus line drawing means draws a locus or vertical line on the synthesized image by projecting the locus or vertical line viewed from a viewpoint of the image pickup means onto a road surface and again projecting the projected locus or vertical line viewed from the virtual viewpoint onto a plane corresponding to the road surface”.

These features are supported in the recitations from line 21 of page 10 to line 18 of page 13 in the present specification as originally filed. Therefore, it is clear that these added features do not present prohibited new matter and the amendments introducing these features should therefore be entered.

Claims 23, 51, 54 and 58 have been amended to now contain:

the feature of “image pickup means is attached to a car placed on a road surface”,

the feature of “viewpoint change image synthesizing means produces a synthesized image, in which a surrounding object is viewed from a virtual viewpoint different from a viewpoint of the image pickup means along a direction substantially vertical to a road surface, from an image obtained by said image pickup means and draws the synthesized image on a plane corresponding to the road surface”, and

the feature of “auxiliary line drawing means draws an auxiliary line on the synthesized image by projecting the auxiliary line viewed from a viewpoint of the

image pickup means onto a road surface and again projecting the projected auxiliary line viewed from the virtual viewpoint onto a plane corresponding to the road surface”.

The feature of the auxiliary line drawing means is supported in the recitations from line 2 of page 25 to line 7 of page 27. Therefore, these amendments do not introduce any prohibited new matter and should be entered.

Claims 28, 52, 55 and 59 have been amended to depend from newly amended claims 1, 50, 53 and 57, respectively.

There are significant differences between the subject matter of the amended claims 1, 23, 28, 50-55, and 57-59 and the disclosure of the cited Shimizu reference.

The present invention is directed to a picture synthesizing apparatus comprising: image pickup means, viewpoint change image synthesizing means, car locus line generating means (or auxiliary line generating means), and car locus line drawing means (or auxiliary line drawing means). An image viewed from a virtual viewpoint along a direction vertical to a road surface is disclosed to be synthesized from an image viewed from a viewpoint of the image pickup means, and the synthesized image is drawn on a plane corresponding to the road surface.

Further, a locus or vertical line (or auxiliary line) is claimed to be drawn on the synthesized image by projecting the locus or vertical line viewed from the viewpoint of the image pickup means onto a road surface and again projecting the projected locus or vertical line viewed from a virtual viewpoint onto a plane corresponding to the road

surface. Therefore, even though distortion of a surrounding solid object drawn on the synthesized image occurs during the viewpoint change and the image synthesis, the locus or vertical line of the car can be drawn on the synthesized image while distorting the locus or vertical line similarly to the distortion of the surrounding solid object. Accordingly, a driver can easily grasp a three-dimensional position relation between the surroundings of the car and a predicted locus of the car.

In contrast, the Shimizu reference discloses a vehicle drive assist system comprising a camera (10), display means (4), steering angle detecting means (12), traveling path predicting means (20), and drive assist means (see Abstract). The drive assist means modifies a backward area image into an image having a field angle equal to that of a rear view mirror. Therefore, a driver looks at the backward area image as if he is looking at the rear view mirror (see lines 5-11 of column 71). When a parking assist is carried out, a three-dimensional image containing the vehicle height is additionally displayed along a predictive traveling path (curve), and a display of the 3-dimensional image is changed at a position near an obstructive object. Therefore, it is easy to check for the possibility that the vehicle being parked will touch an obstructive object near its traveling path (see lines 12-28 of column 71 of the reference). The drive assist means displays the 3-dimensional image in the form of planes each having a predetermined shape that are arrayed at fixed distances along the predictive traveling path curve (see lines 29-33 of column 71). A display is presented such that a simulation image of a self vehicle moves in the image picked up by the camera (see lines 3-5 of column 72). Guide lines extended from lines defining the width of the vehicle and distance lines are overlaid on the backward area image (see lines 50-53 of

column 72).

However, the Shimizu reference does not disclose or even suggest any one of the following features:

(1) a synthesized backward area image viewed from a virtual viewpoint different from a viewpoint of the camera along a direction vertical to a road surface,

(2) the drawing of the synthesized backward area image on a plane corresponding to the road surface, and

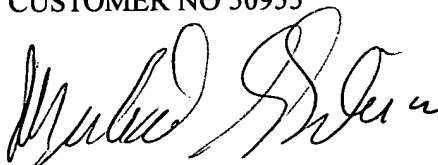
(3) the projection of an image of a guide line onto the road surface and the projection of the projected image onto the plane corresponding to the road surface. Therefore, in the disclosure of the Shimizu reference, the guide line of the car cannot be drawn on the synthesized backward area image while distorting the guide line similarly to the distortion of a surrounding solid object in the backward area occurring during the viewpoint change and the image synthesis.

In addition to the claim amendments referred to above, other of the claims of the instant application have been amended in an editorial manner in order to place them in better form for United States patent practice. It is urged that no prohibited new matter has been introduced by these amendments and they should be entered. Further, the claims so editorially amended should not give rise to any prosecution history estoppel or limitation on the scope to be accorded to these claims under the doctrine of equivalents because these amendments did not address the patentability of these claims but rather clarified their language.

For the aforementioned reasons, it is believed that the subject-matter of the amended claims 1, 23, 28, 50-55, and 57-59 is clearly distinguished from the disclosures of the Shimizu reference alone or even when considered in combination with the disclosures of the Okamoto and Williams references. Thus, the outstanding rejections, based on an obviousness theory under 35 U.S.C. 103(a), should now be withdrawn and all of applicants' claims be indicated to be allowable.

Respectfully submitted;

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A handwritten signature in black ink, appearing to read "Michael G. Gilman", written in a cursive style.

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Docket No. 041-2083

Filed by Facsimile
May 6, 2005